2016 – 2017 Activity Report

Signs of the Seasons:

The New England Phenology Program

Sea Grant Maine at the University of Maine

1865 THE UNIVERSITY OF MAINE Cooperative Extension

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Thank You to Volunteers and Partners

Signs of the Seasons could not be so successful without the involvement of our wonderful volunteers and partners. In 2017 alone, we trained more than 80 new volunteers to phenological observations in their local areas. The data collected by our volunteers is a valuable component in research projects across New England to understand the local manifestations of changes in climate.

We have designed this document to provide you with the highlights from 2016 and 2017 and celebrate our collective accomplishments. We also outline our goals for 2018 and look forward to having you be a part of the journey.

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Assistant Coordinator: Elisabeth Maxwell

Advisory Team: (Listed alphabetically)

Ivan Fernandez, Professor, University of Maine, Soil Science & Climate Change Institute

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Partners:

USA National Phenology Network

Acadia National Park

Schoodic Education and Research Center

US Fish and Wildlife Service

Maine Maritime Academy

Maine Audubon

Coastal Maine Botanical Gardens

Summary of Volunteer Observations

"This is an eye-opening program that shows effects of climate change happening in our backyards."

Program Volunteers

Between 2016 and 2017, Signs of the Seasons trained 190 new volunteers at 18 training events across the Maine and New Hampshire. Our volunteers made a total number of 84,041 observations at 117 sites throughout both years.

Our volunteers tended to be the most active during April and May. Many volunteers start observing as early as March and continue through November or December. A few volunteers record species year round.

Overall, Signs of the Seasons has had 550 registered observers in Nature's Notebook.

SOS volunteers made 834 site visits in 2016 and 750 site visits in 2017.

The top three indicator species with the most number of observation records in both 2016 and 2017:

American robin

Ruby-throated hummingbird

Red maple

In addition to the 18 upland species on our indicator list in 2016 and 2017, SOS volunteers recorded observations on 117 other species.

Active Upland Monitoring Sites

Upland monitoring sites are chosen by volunteers in areas where they frequently visit and have regular access. These sites might be on private or public land, and include 71 upland sites in Maine, 5 in New Hampshire, and one in Massachusetts.

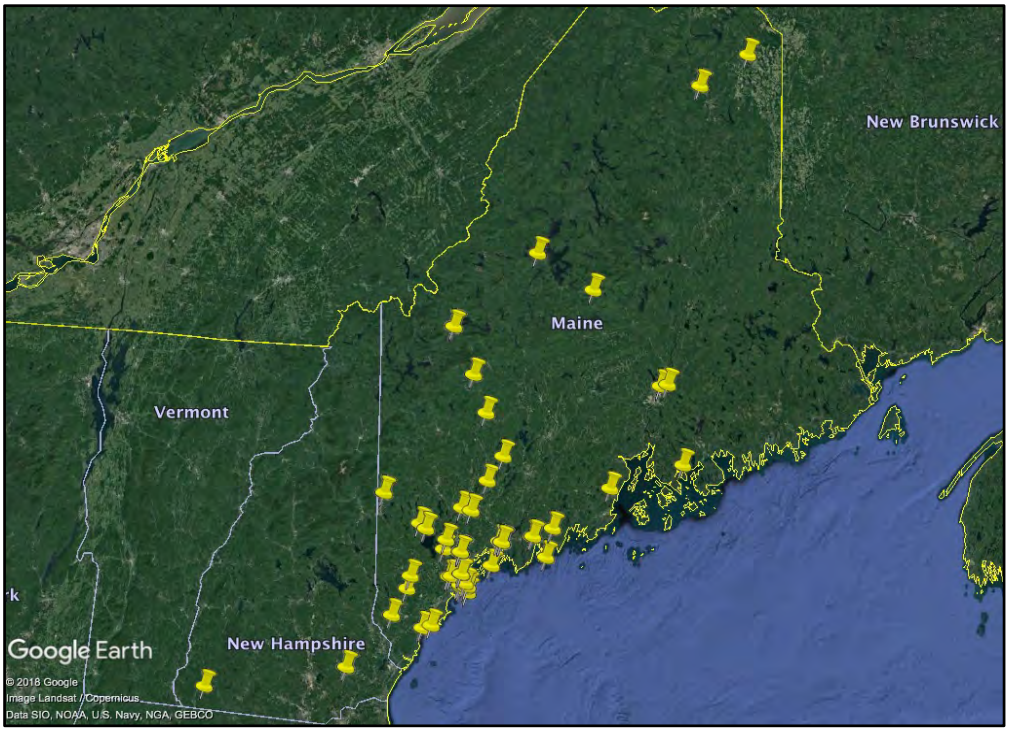


Figure 1: Upland monitoring sites in Maine and New Hampshire marked with yellow pins. Some sites are located relatively close to one another (e.g., opposite shores of a pond or lake), so pins may appear on top of one another when viewed at the state-wide scale.

Active Coastal Monitoring Sites

Coastal monitoring sites are chosen by volunteers based on availability of access to and presence of rockweed (*Ascophyllum nodosum*). There are 26 coastal sites located in Maine and 3 in New Hampshire (Figure 2).

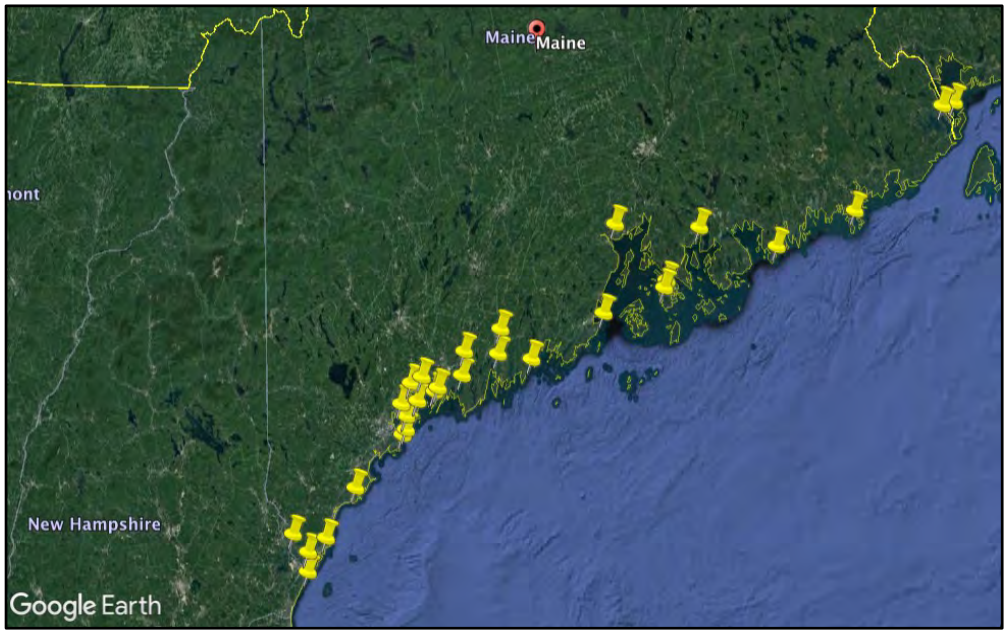


Figure 2: Coastal monitoring sites in Maine and New Hampshire marked with yellow pins.

Highlights from Volunteer Survey

"I feel that this is an excellent opportunity to contribute to a better understanding of our natural world."

Feedback helps us grow as an organization and continue to adapt in order to meet the needs of our volunteer community. In 2017, we conducted a survey of current SOS volunteers to understand their perspectives. Here we provide a summary of these perspectives and the most common points raised.

CONCERN Volunteers voiced concern about being confident in distinguishing between some of the phenophases for *Ascophyllum nodosum* (rockweed) and asked for more clarification and examples.

RESPONSE SOS is working to develop some new resources to help provide clarification and additional examples of each of the phenophases for *Ascophyllum nodosum*. Please keep an eye on our website for when these become available (extension.umaine.edu/signs-of-the-seasons/coastal-observers/).

CONCERN Volunteers said that they would like to receive reminder emails for uploading data and a description of what types of phenophases are expected at that time of the year.

RESPONSE SOS is developing a bi-weekly email newsletter with species highlights, upcoming events, training opportunities, and volunteer spotlights. Stay tuned!

CONCERN There was interest in adding several new species to our indicator list.

RESPONSE In 2018, SOS has added three new indicator species: gray treefrog, lowbush blueberry, and pink lady slipper. These species, along with wild strawberries, are also going to be a focus for a new long-term monitoring site at the Coastal Maine Botanical Gardens.

Data Applications

"...a useful small step, taken regularly, moves us forward."

The data collected by SOS volunteers not only contributes to the National Phenology Network database but also is used by local researchers and institutions in Maine. Recording the phenology of our indicator species at sites across the state provides a greater amount of data at higher resolution than would be feasible for a single researcher to collect on their own.

COMMON LOON (*Gavia immer*)

For 35 years, Maine Audubon has organized the annual Loon Count event where volunteers gather on lakes across the state to record and observe loons and their chicks. While this popular event is extremely helpful for evaluating the loon population, it only provides a "snapshot" of information. Extended phenological observations by SOS volunteers is a valuable way to fill in data gaps and provides a more well-rounded understanding of adult and chick loon population status in Maine.

ROCKWEED (*Ascophyllum nodosum*)

Dr. Jessica Muhlin, with Maine Maritime Academy (MMA), uses the information collected by coastal SOS volunteers to complement her own research data. Collaborating with SOS allows Dr. Muhlin to apply her research questions to sites along the coast of Maine instead of focusing on just a few sites located close to MMA.

Publications & Other Products from 2016 & 2017

"[Participating] heightens my powers of observation of the natural world."

Publications

In the fall of 2017, the *Maine Policy Review* featured a special issue on Citizen Science. The Signs of the Seasons program was the focus of one of the articles in this issue that included information about the value of the data collected by our volunteers for documenting changes in the onset of phenophases in relation to regional changes in climate.

Stancioff, E., Bisson, B., Randall, S., Muhlin, J., McDonough, C., and Gallow, S. (2017). Signs of the Seasons: A New England Phenology Program. *Maine Policy Review, 26* (2): 19-26.

LINK: mcspolicycenter.umaine.edu/mpr/recent-issues/maine-policy-review-vol-26-no-2/

Signs of the Seasons was included in a list of ways that Mainers can contribute to their communities by donating time.

Pols, M. (2017, July 9). 10 ways to be a better neighbor by volunteering. Portland Press Herald.
LINK: pressherald.com/2017/07/09/10-ways-better-neighbor-volunteering/

In a special issue of *UMaine Today* focusing on the links between Acadia National Park and the University of Maine, Signs of the Seasons was featured as a program that raises awareness about climate change while providing scientific engagement.

Kahl, E. (2016). A century in Acadia: The symbiosis between a national park and Maine's public research university. UMaine Today.
LINK: umainetoday.umaine.edu/stories/2016/a-century-in-acadia/

Signs of the Seasons presented a poster at the National Citizen Science Conference held May 2017 in Twin Cities, Minnesota.

Stancioff, E., Bisson, B., Webber, H., and Muhlin, J. Signs of the Seasons: working with citizen scientists and research partners in New England to compare current and historical phenology data for growth and reproduction in upland and marine species"

Webinars

Coastal Research Update

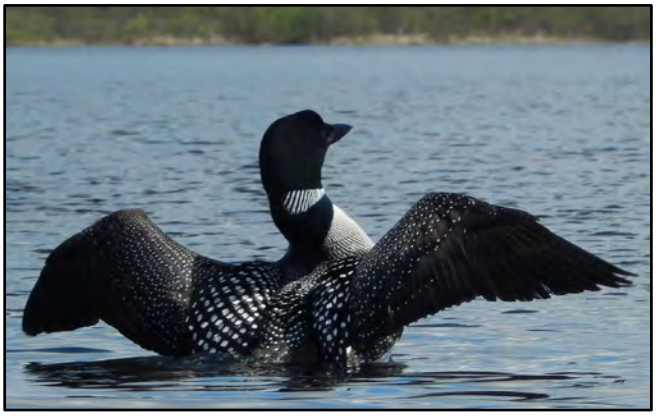
Dr. Jessica Muhlin, Maine Maritime Academy

This program provides an introduction to Signs of the Seasons coastal observing protocols and an *Ascophyllum nodosum* (rockweed) research update by our collaborating scientist, Dr. Jessica Muhlin from Maine Maritime Academy. (Recorded June 20, 2017).

LINK: youtube.com/watch?v=Y-wzr0wxHOI

The State of Maine's Loons

Susan Gallo, Maine Audubon



Where do loons go in winter? What do they eat? How many are in Maine? How are they impacted by climate change? Learn the answers to these and many more questions in this short, informative multimedia webinar. The webinar also looks at population changes over the last 33 years, research on causes of mortality, and efforts to conserve their lake habitat in Maine. (Recorded July 13, 2017).

LINK: youtube.com/watch?v=Bf-HpAK0h5Y

Uncovering the Past Through Maine's Historic Phenology Data

Dr. Caitlin McDonough MacKenzie, University of Maine and Acadia National Park

Learn about Dr. Caitlin McDonough's research to identify, compile, and analyze phenology resources in the understudied region of northern New England and quantify the flowering and leaf out responses of species and populations in these plant communities. In this webinar, she talks about her historic collaborators — a hunting guide's journal from mid-twentieth century northern Maine and the 1894 *Flora of Mount Desert Island, Maine*. (Recorded August 4, 2017).

Link: youtube.com/watch?v=ckDQb3dzCvY

Goals for 2018

"We all see nature around us every day. Phenology observation helps to pay attention to what is changing, reminding me how I can impact my surroundings."

New Indicator Species

Gray treefrog (*Hyla versicolor*)

The gray treefrog, sometimes called the Northern gray treefrog, is closely related to the Cope's gray treefrog (*Hyla chrysoscelis*), with overlapping range and identical physical appearance. These two species are distinguishable based on variation in their calls. *Hyla versicolor* has a longer, slower call with a pulse rate that is about half as fast as the Cope's treefrog. The gray treefrog is common to the Northeast but has a distribution ranging from Texas across to northern Florida and up to Maine and New Brunswick. They prefer wooded habitats with trees and shrubs near to water sources.

Link: Gray tree frog (*Hyla versicolor*)

Low bush blueberry (*Vaccinium angustifolium*)

The lowbush blueberry is the state fruit of Maine and a favorite native shrub. The range includes the northeastern United States and eastern and central Canada. Lowbush blueberry is a deciduous shrub that prefers acidic, well-drained soil with partial to full sun. The plants are fire-tolerant and can increase in number following a forest fire. Habitats that are favorable to growth can result in a natural barren where the lowbush blueberry is the dominant species across a large area. This native plant is grown commercially in many places across the northeast, including Maine. In addition to commercial harvest, lowbush blueberries are harvested recreationally and consumed by species as diverse as black bears, foxes, deer, birds, and porcupines.

Link: Lowbush blueberry (*Vaccinium angustifolium*)

Pink lady slipper (*Cypripedium acaule)*

There are four species of lady slipper in Maine, including the pink lady slipper, which is listed as a species of "special concern" in the Native Plant Protection Act. These orchids are showy but only grow in special habitats so collection could threaten even the more common species. Lady slippers have a symbiotic relationship with a fungus that provides the plant with nutrients. Because of this relationship, transplantation of pink lady slippers is rarely successful unless there is a sufficient amount of fungus available in the new area.

LINK: Pink lady slipper (*Cypripedium acaule*)

Long-term Monitoring Sites

Every site in our program provides valuable data for observing phenological changes throughout the region. But long-term monitoring sites provide an additional layer of information by focusing a greater observation effort in a continuously accessible location.

Maine Audubon Fields Pond Station in Holden added long-term observation sites in 2015 with several SOS species including spring peepers, wood frogs, ruby throated hummingbirds, and several flowering plants.

We are excited to be partnering with the Coastal Maine Botanical Gardens to establish long-term monitoring within the grounds of the gardens. This will allow staff and current volunteers to join in their efforts so that more observations can be made than would normally be feasible.

Webinar Series

We are in the process of inviting some exciting researchers to share their projects and results with us in 2018. Please keep an eye on our website for more information and dates when they are scheduled: Link to website

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FACEBOOK PAGE: facebook.com/UmaineSignsoftheSeasons

Interested in being trained as a SOS volunteer? Fill out our interest form:
extension.umaine.edu/forms/natural-resources/sos-volunteer-interest/

Image Credits

Page 3 - Esperanza Stancioff explaining forsythia phenology at a volunteer training: Kathlyn Tenga-González; others: Creative Commons

Page 7 - Volunteers practicing the monitoring protocols for rockweed (*Ascophyllum nodosum*) at a training event: Hannah Webber

Page 8 - Cover of the Fall 2017 issue of the Maine Policy Review, featuring citizen science projects in Maine: mcspolicycenter.umaine.edu/mpr/

Page 9 - Common loon (*Gavia immer*): Cindy Eves-Thomas.

Page 10 - Two gray treefrogs (*Hyla versicolor*): Public Domain; Lowbush blueberry (*Vaccinium angustifolium*): Caleb Slemmons, National Ecological Observatory Network, Bugwood.org, Creative Commons Attribution-Noncommercial 3.0 License.

Page 11 - Pink lady slipper (*Cypripedium acaule*): J.J. Harrison, Creative Commons Attribution 3.0 License, commons.wikimedia.org; Seed head of a common dandelion (*Taraxacum officinale*): Kathlyn Tenga-González.